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ABSTRACT

The staff of a heart and circulatory disease program of a State department of health conducted a special project at a city hospital which showed that a well-organized treatment and education program for patients with congestive heart failure increased the patient's knowledge of his disease, medication, and diet as well as his adherence to a prescribed regimen, and significantly reduced the number of readmissions. A multidisciplinary team from several agencies with a coordinated educational approach was more effective in treatment than the same agencies providing uncoordinated treatment but similar care. An "educational prescription" devised by the entire team for each patient became the focal point and format for decisionmaking; it was the official mode of treatment and part of the patient's chart. The low level of formal education among the patients necessitated involvement of other family members in treatment, and weekly group sessions were attended voluntarily by patients as an educational supplement to the "prescription." (Author/AJ)

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Patient Education Leads to Better Care for Heart Patients

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AS the nation's economists join leaders in the health field in looking for ways to halt spiraling hospital costs, one avenue of approach that holds great promise for further exploration is well-organized treatment and education programs for patients.

Recognizing that congestive heart failure is an important public health problem, particularly in persons over 60, the staff of the heart and circulatory disease program, New Jersey State Department of Health, initiated a special heart project early in 1964 (*1*). The project was conducted at St. Peter's General Hospital, New Brunswick, N.J., from 1964 to 1966.

In essence, the New Jersey study showed that an education program for 50 patients with congestive heart failure increased the patient's knowledge of his disease, medication, and diet as well as his adherence to a prescribed regimen. When studied against the previous experiences of these patients as well as against the experiences of a control group, readmissions and total readmission days were significantly reduced.

It is known that a myocardial infarction may precede the onset of decompensation and congestive heart failure. Other causes may be acute rheumatic carditis, infections, and pulmonary embolus. In many if not most recurrences, none of these rather obvious causes have existed. Other factors that might precipitate an acute bout of congestive heart failure are stress, dietary indiscretions, failure to take medication as prescribed, and failure to follow limitations in activity.

Each study patient had a history of congestive heart failure, characterized by recurrent attacks requiring immediate hospitalization, which might be prolonged into a period of weeks. Such recurrences disrupted the patient's life, were costly to him and to his family or to the community, and caused him acute anxiety because of the fear of recurrences, which might result in death.

Criteria and Objectives

Project plans called for a multidisciplinary team of hospital, community agency, and State agency persons who could provide services organized

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around the existing cardiac clinic of a hospital. Criteria for selecting the hospital were (*a*) a well-established outpatient medical clinic headed by a board-certified cardiologist or internist, (*b*) qualified and cooperative nursing and diet counseling agencies in the community, and (*c*) an interested hospital administration (*1*). St. Peter's General Hospital (290 beds) met these criteria.

The project had three major objectives:

1. To provide comprehensive care to congestive heart failure patients with quality services in medicine, nursing, diet, health education, and social aid.

2. To evaluate the usefulness of a comprehensive multidisciplinary team approach utilizing planned and coordinated education for the patient and his family, to halt or delay progression of the congestive heart failure syndrome.

3. To serve as a demonstration project to other hospitals in the State.

Planning the Project

Preliminary planning was conducted at a series of meetings that brought together consultants from the State health department, the hospital administrator, the nursing services director from St. Peter's hospital, and representatives from the two community agencies that were to be actively involved in the project: the voluntary public health nursing agency and the diet counseling service associated with Rutgers University in New Brunswick. The chief of the hospital's cardiopulmonary laboratory, who attended the meetings, was also vice president of the Middlesex County Heart Association and headed the cardiac clinic. The project, organized around the existing cardiac clinic, had as its coordinator a social worker who would also provide the social casework service to patients and their families. The social worker as well as the diet counselor and the public health nurse from the community agencies and a health educator from the State health department were to be present at each clinic for consultation to physicians and patients. Weekly patient conferences were held by the team.

Research design. The research design, developed by the State health department and the hospital, called for 50 patients with congestive heart failure who were outpatients of St. Peter's hospital. Another 50 patients with a similar diagnosis were outpatients at three other hospitals in the State and were to constitute the control group. During an observation period of 1 year, control patients received normal clinic care, but the patients at St. Peter's hospital received the services of the educationally oriented multidisciplinary team.

It was acknowledged at the onset that there would be a certain lack of validity in comparing outpatients from different hospitals who might not receive comparable care even though the diagnosis was similar; however, specific criteria such as sex, age, comparable etiology, and functional classification were established as the parameters for comparisons. In addition, while it was recognized that congestive heart failure is a progressive disease, it was decided to compare the group's experience against itself; that is, to compare an equal number of days at risk for each patient before and after his or her acceptance to the project.

Thus, in effect, there were two controls: patients from other hospitals and the study group's prior experience. This second control would negate as much as possible the problems related to comparable care, age, sex, differential diagnosis, and other variables.

Specific evaluation was to be made, by comparing the functional classification accepted by the American Heart Association (*2*), of the study patients at the beginning and end of the program and by measuring the number of hospital readmissions and hospital days for congestive heart failure for the study and control groups.

Initial procedures. Twenty-two patients already attending the cardiac clinic were approved as meeting the following medical criteria for admission to the project: the presence of symptoms and signs of congestive heart failure such as shortness of breath on exertion, orthopnea, paroxysmal nocturnal dyspnea, ankle edema, and hepatomegaly; also evidence of some underlying heart disease. The remaining 28 patients joined the project as they were referred.

Before being seen by the physicians, the patients and persons accompanying them, usually a spouse, were invited by the outpatient supervisor to meet informally with some of the project staff. The health educator explained that the project had been designed to give them a new type of service in an effort to find the best way to treat patients with congestive heart failure. They were given the opportunity to ask questions and with-

draw if they wished. No one refused to participate.

Once the patient agreed to be part of the project, he was given a structured interview, which provided social and demographic data as well as information about his knowledge of medications, diet, and the disease process. Repeat interviews were scheduled at 6-month intervals to determine knowledge and attitudinal changes. (Interview schedules are available from the author.)

Initial interview data are incomplete for seven patients because they or their spouses became irritable or nervous during the interview. Final interview data were available from 49 of the 50 patients. One patient moved out of the area.

The patients were initially examined in the cardiac clinic. Since this examination was considered to be the first, previous histories and results were ignored. The examination, constituting admission to the project, included a detailed history and a careful physical examination. Tests included chest X-ray, electrocardiogram, complete blood count, urinalysis, fasting blood sugar, blood urea nitrogen, serum sodium, potassium, chlorides, carbon dioxide, and 24-hour urinary excretion of sodium.

The social worker and diet counselor interviewed the patients as soon as possible after they were seen by the physicians. Home visits by the social worker and public health nurse were made routinely at the convenience of the patients. Whenever possible, joint visits were scheduled.

The Team Conference

The first meeting of the team was attended by the project's medical director, project coordinator, health educator, public health nurse, diet counselor, hospital dietitian, associate director and supervisor of the outpatient department, chief medical resident and two medical residents, the director of the Visiting Nurse Association, and the social worker. Three consultants from the State health department (social worker, dietitian, and public health nurse) attended as participant observers.

Although the State health department specified the qualifications of individual team members and the general structure of the project, it remained for the team itself to construct the details for working together. Cooperation was accomplished through a free exchange of ideas; the procedures were sufficiently flexible to allow for needed modifications.

A format evolved for reporting information to the team. First, the physician presented his findings after which the public health nurse reported on her evaluative interview. An account of the patient's diet was given by the diet counselor, based on a 24-hour recall of the diet and a 24-hour specimen of urine, which was analyzed for its sodium content. Then the health educator reported the results of his interview. After the reports were discussed by the team, plans were made for treatment and education of the patient.

At the first team conference a physician who had examined a patient at the clinic reported that she had diabetes in addition to congestive heart failure. The social worker described her as being a very anxious person, living with her husband on a low social security income, supplemented by welfare, and having serious financial problems. These problems were increased by the need for special diets and the cost of taxi fare to the hospital. The public health nurse reported that the patient sat all day by the window in a housing project, frightened by the crowds of noisy children outside. The health educator stated that the questionnaire had been answered mainly by the patient's husband. Both the patient and her husband had shown some knowledge of her medications but had no information concerning a low-sodium diet. The diet counselor noted that the patient had difficulty following a diabetic diet on a low income and was confused by the combination of diabetic and low-sodium diets.

The team acquired a many-sided view of this patient. All entered freely into the discussion that ensued. The clinic director and head nurse, who had known the patient for many years, contributed meaningful comments. Joint decisions were reached. The possibility of treating the patient's diabetes in a congestive heart failure clinic had to be cleared with the diabetic clinic by the medical director. The social worker had to find out whether the patient was budgeted by welfare for a diabetic diet and ask the agency for a taxi allowance. The patient had to be instructed by the diet counselor regarding her diabetic low-sodium diet. The public health nurse was asked to visit the patient's home to stress the importance of adhering to a prescribed diet and to inform her about her medication. The physician, during her next clinic appointment, also inquired about her knowledge of the medication and how she was faring on her diet.

It was soon recognized that these educational assignments were beginning to take form. There-

fore, a prescription of educational need or, as it came to be called, an "educational prescription" was devised by the team as a focal point and format for decision making on the patient's educational needs.

This procedure was followed, with modifications, at ensuing meetings of the team. After a time it was agreed that the social worker, health educator, public health nurse, and diet counselor would read written reports at each conference. Still later the medical director suggested, and the team agreed, that the date of the patient's admission to the project and the reports from each discipline would be made a part of the patient's clinical chart, and that the minutes which concerned the patient would also be inserted into her chart as progress notes.

Early in the project, team members learned of the contribution, actual or potential, of other team members to the patient's treatment. Confidence in each other and in the team method developed slowly. It was only as the group met weekly around the conference table and were confronted by the records of patients who for years had responded only minimally to treatment, and as new points of view brought up new problems and also possible new solutions, that a real team approach to patient care gradually evolved.

A good example of evolvement and involvement follows. One of the first patients discussed in conference was a woman in her eighties, who was diabetic in addition to having congestive heart failure. She had been known to the clinic for many years and was uncooperative. She often did not keep clinic appointments. The physicians suspected that she neither took her medication nor followed her diet, but they were not sure since she was essentially uncommunicative.

From the reports of the social worker and nurse about home visits, the team learned that the patient lived alone in a cold-water flat on a monthly income of $68, which left little to pay for medicines. She was alienated from her relatives and often was so depressed she hoped that she would die in her sleep. While the nurses at the outpatient clinic had some knowledge of her problem and had in crisis referred her to the public health nurse, who had visited her, the patient's condition remained critical.

The team agreed that the patient was not following either the diabetic or low-sodium diet, had insufficient money, and should move from her residence. As a result of the conference, the physician who was team leader suggested the following educational prescription: (*a*) the dietitian was to set up a diet for the patient and explain it to her in detail, (*b*) the public health nurse was to instruct her in the use of insulin and see that she took it, and (*c*) the social worker was to give her emotional support, help to improve her relationship with her son, and motivate her to move. This educational prescription was incorporated in the patient's chart and was used later as an evaluation tool.

Table 1. Distribution of 50 patients on admission to program, by age and sex

Age (years)	Male	Female	Total	Percent
26–35	0	1	1	2
36–45	2	6	8	16
46–55	3	5	8	16
56–65	5	4	9	18
66–75	2	12	14	28
76–85	3	6	9	18
85 and over	1	0	1	2
Total	16	34	50	100

Helping this patient was not a casual attempt of different disciplines to work out a plan to help the patient; instead it was the official mode of treatment prescribed by the entire team that was responsible for results.

During the first 3 or 4 months of the project, the team conferees were those directly involved in treating the patients and consultants from the New Jersey State Department of Health. Occasionally, a representative from one of the interested agencies attended. Medical and nursing participation was limited to outpatient staff and cardiology residents.

As the program proceeded and project patients were admitted to the hospital for congestive heart failure and for other reasons, such as diabetes and cancer, other hospital staff (the supervising nurse in charge of the medical floor, the head nurse of the service wing, and various members of the dietary department) became an integral part of the team.

Age, Education, and Knowledge of Disease

A considerable, unexpected variance was found in the ages of the patients, which ranged from 31 to 89 years (table 1). Only 24 of the 50 patients, or 48 percent, were over 65; four were 65 years old. Sixteen were between the ages of 36 and 55. Thus, in this study, congestive heart failure could not be considered a disease only of the aged.

There was considerable range in education

from no schooling at all for six patients—five lived till maturity in a non-English speaking community and did not learn to read or write English; the sixth was a 57-year-old woman from South Carolina—to a single high school graduate, a woman 45 years old. None of the patients had any college education or special training. The average period of attendance at school was 6.7 years.

Nine members of the group were unable to read or write English though only three of these were unable to speak English. Family members interpreted for them. Eleven patients were born outside the continental United States.

Knowledge of illness. From the initial structured interview with the patients it was found that, of 44 patients for whom data were available, 28 or 63.6 percent knew that they were taking digitalis or a diuretic or both. No other medications were considered. Acceptable terms for identifying a diuretic included "water pill" or the specific brand name of the drug. The only acceptable term for digitalis was "digitalis." Other terms such as "blue pill," "green pill," or "heart pill" were considered incorrect.

Of 34 patients for whom data were available eight, or 23.5 percent, did not know that they were on a specific or prescribed diet. When questioned concerning 13 specific foods that should not be consumed by patients on a sodium-restricted diet, 41 percent of all answers were incorrect. On an average then, each patient was able to answer only 5.3 percent of 13 questions correctly.

Seventeen of 34 patients did not know or recognize the term "low-sodium diet," and 18.7 per cent, or 6 of 32, did not recognize or understand the term "low-salt diet." Eighteen of 32 patients, or 56.2 percent, could not give an adequate explanation of the term "low-fat diet." Eighty-four percent thought that learning about their illness would help them do a better job of attending to their needs, and 86.4 percent of those questioned were willing to discuss their illness and problems related to their illness with others in the program.

Education for relatives. Involving family members was an important [illegible] of the treatment and was used extensively b[illegible] disciplines, especially the health educator, who frequently included the spouse or another close relative in the preliminary questionnaire interview. If a patient lived at home, the spouse sometimes knew the amount of prescribed medication and when it should be taken, but often he or she had many misconceptions about its need and purpose. Because of the low income of all patients in the project, in many families there was a definite weighing of the relative merits of spending money on the patient's medicine or on the family's food.

The team felt that relatives who did not live with the patient also should have a real understanding of his condition since they too had a role in treatment. For example, one well-meaning daughter who had been giving her mother fish whenever her husband had fished at the seashore was totally unaware of the high salt content of the fish. Almost all patients depended on relatives for transportation to the hospital and, in general, for help of one kind or another such as shopping, doing personal or household laundry, or just offering an understanding ear when the patient's feeling of futility became unusually strong. It was common for patients to be acutely aware of their dependency and to resent it. The team attempted to give various members of each patient's family some insight into his feeling about his illness and how this affected his behavior. Much of this counseling was done through group discussion sessions.

Group Sessions for Patients

The hypothesis that group discussion and decision making is more effective in changing behavior than either lectures or individual instruction has been tested in a number of studies in the past few decades. Such studies of housewives or mothers of comparable age and socioeconomic background showed that group discussion reinforced individual instruction so that knowledge became internalized. The degree of success that could be expected in a group of physically and emotionally deteriorated persons of heterogeneous ages and backgrounds was questionable. The health educator thought the method was applicable and should be tried.

The team felt that the health educator was the only person on the team with experience in this educational technique and that he should lead the group sessions. The social worker, public health nurse, and community diet counselor were to observe, learn the technique, and provide technical information on request. It was agreed that the group should begin with a few patients, and those with sodium-restricted and diabetic diets would be invited first.

In his initial interview with the patients the health educator asked each one, "Would you be willing to discuss your illness and problems with

other people who have the same illness and problems?" With few exceptions the answer had been "Yes."

Two weeks before the group sessions, letters were sent inviting six patients to a meeting and suggesting that they each bring a relative. The patients were asked to telephone the project office if transportation was needed. The six invited had little in common except the diagnoses of congestive heart failure and diabetes. They varied in age from 52 to 78 years and in education from 4th to the 11th grade; two had been born in Europe.

Four patients attended the first group session. Two were accompanied by their spouses and one by her daughter. The fourth patient was a bachelor. Since the patients had been in the special heart project for several months, they knew the team members, but they were not as well known to each other. The health educator explained that they were brought together so they could learn more about their illness and ways to improve their health. No agenda or time limit was set for the meeting so that the group could discuss whatever they wished. They expressed surprise when they learned that all patients in the group had both diabetes and congestive heart disease.

The discussions ranged from the relative sodium content of fresh, canned, and frozen peas; vegetables with less sodium content than peas; and low-salt bread to the sodium content of baking soda and soda-based baking powder. The decision making process was adhered to throughout the meeting. For example, after much discussion, the group decided that they should not eat frozen peas because of the high salt content.

The patients found that by coming together they not only learned more about diets but experienced other benefits as well. Encouraged by others in the group, one timid patient expressed an opinion without being overshadowed by his wife. Another patient, who according to the social worker considered herself unsociable, expressed herself freely and positively while her more sociable husband was not accepted well by the group.

All expressed enthusiasm and interest in continuing the group sessions. They chose the need for "water pills" as the topic for discussion the following week. Other patients in the project were invited to attend the sessions.

The informality of these group sessions was maintained. While the number of patient participants varied each week, a nucleus remained constant. Participation and attendance of staff members varied, but at least two different disciplines were always present. The goal was to allow the patients to discuss and participate freely with a minimum of direction. Initially, the patients related to the discussion leader, but under his guidance they began to relate to other members of the group.

A series of slides on diabetes, initiated at one patient's request, continued for 4 weeks with discussions after the slides were shown. This procedure proved to be less helpful than free discussion and certainly was less stimulating. The patient who suggested the slides ceased coming because he found them boring.

The theme of anxiety about treatment or not knowing "what the doctors are doing to me" ran as an undercurrent throughout the group sessions and was brought into the open on numerous occasions.

During the 16th session, an evaluation was attempted. What had the patients gotten out of the group sessions? Should the sessions continue? If so, what should be emphasized?

The variety and quality of responses were surprising. One patient said the group "helps you understand yourself and other people better," and she wanted to learn all she could about her illness. Another patient liked to attend because she "lost a lot of weight and learned to eat salads and fruit." The group agreed that there were many medical questions for which they would like an answer. Each contributed questions that were to be given to a physician on the team with a request that he meet with the group. For example:

1. What is congestive heart failure?
2. What caused a patient to have congestive heart failure when she was merely sitting at home after discharge from the hospital for a gastrointestinal condition?
3. What causes blood clots?
4. What are the mechanics of the heart, valves, and so on, and how do they work?
5. How does the heart react to stress, to overwork, or to getting upset?
6. What is meant by rehabilitation as applied to heart disease?
7. What causes a heart attack?
8. What is meant by rheumatic fever, and what is the relation between this disease and congestive heart failure?

A medical resident who had been involved in the special heart project since its inception met with the group and answered many of these questions.

The staff planned to discontinue the sessions for the summer or reduce them to biweekly meetings,

especially since most of the patients required transportation and it was increasingly difficult to provide, but the patients emphatically asked that weekly sessions be continued.

There were 28 weekly group sessions. Nine patients attended 10 or more sessions and six came only once or twice. Three to nine sessions were attended by nine patients. The remaining 26 patients had attended no sessions, though most had been invited. Attendance at the sessions ranged from four to 12 patients, with an average attendance of seven.

Table 2. Comparison of hospital admissions and hospital days of 50 study patients before and after entry to project

Status of patient	Before entry	After entry
Number of days observed under project	16,663	16,663
Number of patients admitted to hospital	23	6
Number of hospital admissions [1]	35	12
Number of hospital days [1]	600	148

[1] $P = 0.01$.

Table 3. Comparison of hospital readmissions and days, study and control patients, September 1964–January 1966

Group	Number of patients	Total days observed under project	Number of readmissions	Number of readmission days	Percent of observed days
Study	29	9,300	5	82	0.88
Control	29	5,996	9	238	3.97

NOTE: $P = 0.01$.

Table 4. Comparison of hospital readmissions and days for 29 control patents with congestive heart failure

Status of patient	Before entry	After entry
Number of days at risk	5,996	5,996
Number of readmissions	11	9
Number of hospital days	167	238

In evaluating the progress and goals of the sessions, it was concluded that patients who had attended two or more sessions had been able to acquire and use knowledge of diet, medication, and the disease process to a degree that was of distinct help to themselves. This was the primary goal. They had also considerably improved socially and emotionally.

Results

At its inception, the main objective of the special heart project was to halt or delay the progression of congestive heart failure and to help the patient live a happier and more productive life. This goal was to be accomplished by means of a multidisciplinary team that would provide, in addition to the usual medical care, a coordinated, planned educational approach with close followup nursing care, appropriate social services for the patient, and instruction in diet. Assessment of the effects of the program was to be made through measurement of the patient's knowledge, degree of adherence to a dietary and medical regimen, observation of his social functioning, and comparison of hospital readmissions at the end of 1 year.

The number of hospital readmissions and days for each study patient was recorded before and after entry in the project. The information on each patient was studied retrospectively for the length of time he was in the project; that is, if he was in the project for a year, his experience for a year before entry was studied, if a diagnosis of congestive heart failure had been made at that time.

Admissions and hospital days are compared in table 2. Before the project, 23 study patients were admitted 35 times for congestive heart failure. Over a similar period, only six patients were readmitted 12 times for congestive heart failure after entering the project. The difference is significant at the 1 percent level.

Before the project started, these patients spent 600 days in the hospital. After admission to the project they spent 148 days in the hospital. Again, the difference between is significant at the 1 percent level.

Table 5. Functional classification [1] of control and study groups at end of project

Group	Number of patients	Improved		Same		Worse	
		Number	Percent	Number	Percent	Number	Percent
Study	44	13	29.5	24	54.5	7	16.0
Control	19	2	11.0	12	63.0	5	26.0

[1] American Heart Association classification system.

The research design called for comparisons with a control group. Twenty-nine study patients were matched for age, sex, etiology, and severity of heart disease with 29 control patients. Hospital readmissions and readmission days of these two groups from September 1964 to January 1966 are compared in table 3.

The experience of the control group before and after entry to the project is seen in table 4. The increase in readmission days—167 to 238—was not unexpected because of the progressive nature of the disease. From the point of view of the number of hospital readmissions and the number of days hospitalized for congestive heart failure recurrences, significant improvement in the study patients was noted (tables 2–4).

Each patient in the two groups was classified according to his ability to function (American Heart Association classification) at the beginning and at the end of the project. Twelve of the 19 control patients for whom data were available had no change in functional classification (table 5). Five had a decrease in ability to function, and only two improved their functional capacity. In the study group for whom data were available, 24 remained the same, 7 were worse, and 13 improved.

A 24-hour urine specimen was analyzed for sodium for each study patient on admission to the project and at 6-month intervals thereafter. All but three patients were on sodium-restricted diets when the project started. At the first team conference the patients were placed on a mild, moderate, or severe sodium-restricted diet. The excess urinary excretion of sodium over the dietary allowances of the 35 patients for whom complete data were available can be seen in table 6.

The number of correct answers at first and last interviews and the percent increase in correct answers concerning foods restricted on low-sodium diets are shown in table 7. The differences for the increase in correct responses is statistically significant. The increase was 33 percent for the study group and 7 percent for the control group.

Further analysis of the data showed that the average number of questions answered incorrectly by the study and control patients decreased between the first and last interviews (table 8). The differences in the decreases are highly significant.

The study patients' knowledge of their medication increased (table 9); at the initial interview, 63.6 percent of 44 patients could identify the medications they were taking, and in the final interview 93.2 percent could correctly identify them. Seventy percent of the control patients, on the other hand, could identify the medications they were taking at the first interview, but only 60

Table 6. Comparison of excess excretions of urinary sodium over dietary allowances for 24 hours, first and last determinations for 35 patients

Determination	Sodium intake prescribed (mg.)	Excess over prescribed amount (mg.)	Excess excreted over dietary allowance (percent)
First	82,800	83,200	100.5
Last	91,200	38,000	41.7

Table 7. Comparison of correct answers, first and last interviews, to 13 questions on restricted foods in low-sodium diets

Group	Number of patients	Number of times 13 questions asked	Correct answers		Percent increase in correct answers
			First interview	Last interview	
Study	43	559	329	489	33.0
Control	20	260	100	107	7.0

Table 8. Average number of wrong answers, first and last interviews, to 13 questions on restricted foods in low-sodium diets

Group	Number of patients	Average number of wrong answers		Difference
		First interview	Last interview	
Study	43	5.3	1.6	3.7
Control	20	8.0	7.7	.3

NOTE: $P = 0.0001$.

Table 9. Patients' knowledge of medications, first and last interviews

Knowledge	Study group (N = 44)		Control group (N = 20)	
	Number	Percent	Number	Percent
First interview:				
Identified medication	28	63.6	14	70.0
Could not identify medication	16	36.4	6	30.0
Last interview:				
Identified medication	41	93.2	12	60.0
Could not identify medication	3	6.8	8	40.0

percent could identify them at the last interview. This difference is not significant and can be explained by patients' guessing correctly the first time.

Discussion

The test was whether a multidisciplinary team from several agencies with a coordinated educational approach could be more effective in treating 50 patients with congestive heart failure than the same agencies with uncoordinated treatment but with similar medical and nursing care by an outpatient department, visiting nurse association, and diet counseling service. It was concluded that the coordinated educational approach to treatment was more effective. The data show a significant correlation between the attainment of knowledge (tables 7–9) and behavior (table 6). In addition, if acceptable behavior can result in fewer hospital readmissions and days, then tables 2 through 5 must also be considered. A greater knowledge of diet, drugs, and the disease, offered by all members of the team as a part of the treatment, resulted in less use of hospital days by patients.

The two services (social aid and health education) added to the basic clinical services that played a major role in the team's effectiveness. In addition to maintaining the quality of the basic services, they were intensified. The patients had more visits from the public health nurse and more interviews with the diet counselor.

The fundamental difference in service appeared to be (*a*) in the sense of responsibility for treatment, which the team process engendered, and (*b*) in the coordinated, planned educational approach, to which all disciplines adhered. There was a continuing concern for each patient, resulting in careful followup dependent on individual needs. Because the visiting nurse was present at clinic sessions the physician could ask her to visit patients the day after he saw them, if necessary, or between clinic visits.

While patients were hospitalized their cases remained open with the nursing agency and a nurse could immediately visit following discharge. The social worker also understood the patients' personalities and home situations and kept in close touch with the inservice medical staff during hospitalizations. Thus the patients' return to the clinic was assured after discharge, and there was little chance that they would neglect their medication or diet.

Careful followup did not imply a policing system, but from the outset did require each patient's participation in his own treatment while offering him the rationale and help of many disciplines. The importance of assuring that even the illiterate patient knew the reasons for the prescribed treatment so that he would assume the responsibility for his part in the treatment was an outstanding result of the project, according to its staff.

Deterrents to improvement in health. While claiming success in reducing the number of readmissions for congestive heart failure, the team agreed that there were several deterrents to greater effectiveness of the project.

1. Extreme deterioration existed in several patients (six being in class IV of the classification system when admitted) and chronic illness other than congestive heart failure in 21 patients.

2. Patients were scattered throughout a county having poor public transportation.

3. Lack of money for prescribed medication was a continuous problem to all patients except the 32 percent on public welfare, which aided them through a vendor payment system. Because of their low income, many patients were unable, especially toward the end of the month, not only to purchase medication but to follow diets.

Reasons for success of project. Success of this project can be attributed to close cooperation. The team provided a closely knit web of services based on an accrual of knowledge about the patient—his personality, habits, culture, and social setting.

It was recognized that none of the patients were completely self-sustaining in following medical recommendations, and team members in their various professional capacities provided support as needed.

Measures were devised to close existing gaps between hospital care and community living, between inpatient and outpatient department services.

The team, including the physicians and medical residents, remained with the project over the period of study. In addition, the medical residents frequently treated the patients when they were hospitalized.

For the hospital, closer coordination between the outpatient department and inservice care has been one of the outstanding results of bringing residents and nurses together with the outpatient staff.

Medical residents who attended the team conferences became familiar with other treatment disciplines, which they used with other patients. The

demonstrated value of the team conferences led to the adoption of other conferences in the hospital, for example, in planning discharges.

The use of the small group method of education led to use of other groups for teaching purposes; for example, outpatients on the subject of diets for diabetics.

Team members were queried at the end of the study on their reactions. One medical resident stated, "The project has been extremely helpful to the physician as well as to the patients. In a sense it is an approach to the whole person rather than just to the disease. Treating the person is much more important, and you cannot treat a person without knowing his social background." Another medical resident wrote, "My attitude would be that every hospital should have such a team." There was a consensus that the educationally oriented team approach was valuable and should be extended to take care of all chronic diseases; some even wishing to extend such treatment to all illness.

Questions Raised by the Study

If the patients studied were a sampling of the 2,000 patients attending the outpatient department of the hospital, what about the other patients? Are the needs of inpatients any different? Since a dramatic reduction of readmissions is so evident for patients with congestive heart failure, why not apply the methodology to other disease categories in other hospitals throughout the State and nation? Can the lessons of the educationally oriented approach be applied to prenatal care, obstetrics, and other departments of the hospital? What might the cost benefits of such a project be to a hospital or an insurance company? What methods of financing patient education programs are possible?

These and other related questions need to be studied in the light of rising hospital costs and occupancy rates, not to mention the emotional and psychological cost of illness to the patient and his family.

REFERENCES

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(2) The functional and therapeutic classifications of patients with diseases of the heart. *Excerpted from* Diseases of the heart and blood vessels—Nomenclature and criteria for diagnosis. Ed. 6. Little, Brown and Company, Boston, 1964.

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Fifty patients with congestive heart failure were treated by a multidisciplinary team composed of physicians, staff nurses, community and hospital dietitians, a public health nurse, a social worker, and a community health educator. They used a planned, organized, patient education approach with this group of outpatients at St. Peter's General Hospital, New Brunswick, N.J.

The majority of the patients showed substantial improvement when their status before and after the project was compared, using the American Heart Association's functional and therapeutic classification. Thirteen improved in functional capacity, 24 remained the same, and seven were worse.

Before entering the project 23 of the 50 patients were responsible for 35 hospital admissions totaling 600 patient days. At the project's completion, the number of patients readmitted had been reduced to six, and they represented 12 readmissions totaling 148 days.

Comparison with a control group of outpatients at three other hospitals as well as with the study group's experience, measured at the beginning of the project, revealed a greater knowledge of the disease, medications, and diet. Adherence to a prescribed regimen increased remarkably as reflected in the 24-hour urinary specimen analysis. The amount of sodium excreted over dietary allowances was reduced from 100.5 percent to 41.7 percent.

The project demonstrated that the educational approach produced measurable improvement in congestive heart failure patients, that the educational prescription is a useful tool in coordinating care given by a multidisciplinary team, and that substantial benefits can accrue to patients, health professionals, and the hospital from such a project.